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EXAMINER	
CHU, KIM KWOK	

ART UNIT	PAPER NUMBER
2653	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/674,402	RAMANUJAM ET AL.	
	Examiner	Art Unit	
	Kim-Kwok CHU	2653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Amendment filed on 9/9/05*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 9-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,9,10,12-15 and 17-23* is/are rejected.

7)☒ Claim(s) *11 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 October 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. PCT/HU99/00035.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Remarks

1. Applicant's Amendment filed on September 09, 2005 has been fully considered but it is not persuasive.

Applicant explains that one fundamental distinction between his presently claimed invention and the prior art of Faruqi relates to the type of recording used. Applicant states that his claim 1 is generally directed to the use of polarization holography (page 12 of the Remarks, lines 1-3). Accordingly, the prior art of Faruqi also teaches polarization holography using the electro-optic type modulator 8(Fig. 2; page 11, lines 15 and 16).

To support the claimed polarization holography, Applicant discloses that in his invention has following features which are different with the prior art of Faruqi: the intensity does not vary; the index of refraction is modulated through a reorientation of the molecules on irradiation with polarized light; utilizes two beams that have orthogonal polarization and the polarization of the object beam is not modulated (page 12 of the Remark, lines 16-23). Accordingly, above features are not in Applicant's claim 1.

Furthermore, Applicant states that his invention "expressly directed to the use of a thin recording medium with a thickness between 250-1000 nm" (page 13 of the Remarks, lines 2 and 3). Accordingly, the above thickness range is not in claim 1. In

claim 1, Applicant claims the thickness of the claimed recording layer in the order (rank, level) of wavelength of the reading and recording light. Similarly, the prior art of Faruqi's recording layer is typically 50 um thick (page 16, line 25) which is in the order of the laser 17 having a wavelength of 0.78 um (page 12, lines 1-3).

Yet furthermore, Applicant states that his invention "expressly recites that the recording of the information is in the form of data pages stored as Fourier holograms" (page 13 of the Remarks, last 6 and 7 lines). Accordingly, the prior art of Faruqi's data is stored in a 2D holographic pattern (page 1, lines 5-8; page 22, lines 19-23; Fraunhoffer pattern is a hologram).

Yet furthermore, Applicant states another distinction between his invention and the prior art of Faruqi's is that his invention claims "the data storage capacity of the optical storage card can be increased by recording data in multiple layers" (page 14, lines 1-5). Accordingly, the prior art of Faruqi teaches that the storage capacity of his storage card can be increased by recording data in multiple layers (page 17, lines 22 and 23).

Claim Objections

2. Claim 17 is objected to because of the following informalities:

(a) in claim 17, line 3, the term "recording medium according to claim 5 and for a" should be deleted because claim 5 has been withdrawn under a restriction requirement.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> *A person shall be entitled to a patent unless --*
> *(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

4. Claims 1-4 are rejected under 35 U.S.C. § 102(b) as being anticipated by Faruqi et al. (WO 97/02563).

Faruqi teaches a method for the recording and reading of data on a recording medium having all of the steps as recited in claims 1-4. For example, Faruqi teaches the following:

(a) as in claim 1, using a holographic recording medium 25 with a holographic recording layer 48 having a thickness in the order of wavelength of the reading and recording light (Fig. 7; page 16, lines 25 and 26; recording layer 48 stores multiple diffraction patterns);

(b) as in claim 1, the holographic recording medium 25 being preferably an optical card (Fig. 7; page 17, lines 8-10);

(c) as in claim 1, a holographic write/read apparatus 16-24 for the recording medium 25 (Fig. 4);

(d) as in claim 1, the recording of the information is in the form of data pages stored as Fourier holograms recorded in a recording (Fig. 8; page 17, two dimensional holographic recording provides Fourier holograms; lines 22-28);

(e) as in claim 1, the recording of the information is in form of reflected transmission and polarization holography with different write and read wavelengths is used (Fig. 4; page 9, lines 24-27, page 11, lines 20-28, page 12, lines 1-3);

(f) as in claim 1, correcting the distortion during reading in the readout channel caused by the difference between the write and read wavelengths (Figs. 4 and 11; signal processor 27 and optical head 24 reconstruct the stored image without error);

(g) as in claim 2, the wavelength distortion is corrected by optical and/or software means (Figs 4 and 11; both signal processor 27 includes software instructions and optical head 24 reconstruct the stored image without error);

(h) as in claim 3, the holograms are recorded as on-axis (reference beam and object beam has a common optical axis) holograms (Fig. 4; holograms are stored in Z direction which is the common axis of the light beams); and

(i) as in claim 4, the recording is made with polarization multiplexing and/or phase-code and/or rotational multiplexing (Fig. 4; page 9, lines 24-27).

5. Claims 9, 10, 12, 13, 15, 17 and 18 are rejected under 35 U.S.C. § 102(b) as being anticipated by Faruqi et al. (WO 97/02563).

Faruqi teaches an apparatus for the writing and reading of a holographic recording medium having all of the elements and means as recited in claims 9, 10, 12, 13, 15, 17 and 18. For example, Faruqi teaches the following:

(a) as in claim 9, the recording medium 25 is an optical card (Fig. 7; page 17, lines 8-10);

(b) as in claim 9, a recording medium 25 holding an/or positioning mechanism 30 (Figs. 4 and 5); page 15, lines 9 and 10);

(c) as in claim 9, movable or fixed read and write optics 16-24 (Fig. 4);

(d) as in claim 9, the write optics 16 comprising a polarized writing light source (Figs. 4 and 15; laser 1 is inherently a polarized light source and its light beam is further polarized by modulator 73); page 21, lines 13-15);

(e) as in claim 9, polarizing selector means 57 for separating an/or combining the reference beam and an object beam (Figs. 4 and 11; page 21, lines 27-31);

(f) as in claim 9, an object beam modulating means 24 (Fig. 4);

(g) as in claim 9, a polarization wave plate 56 (Fig. 11);

(h) as in claim 9, an objective lens 58 for imaging the object beam onto a recording layer (Fig. 18; page 22, lines 1 and 2);

(i) as in claim 9, the read optics 17, 24 comprising a polarized reading light source 17 (Figs. 4 and 15);

(j) as in claim 9, the read optics includes a polarizing selector 57 and/or spatial filtering means 39, 42 for separating and/or combining a reference beam and an image beam (Figs. 6 and 11);

(k) as in claim 9, a light detector 44, 45 and an objective lens 58 for imaging the image beam onto the light detector (Figs. 4, 6 and 11);

(l) as in claim 9, the wavelength of the reading light source is different from the writing light source (Fig. 4; page 11, lines 23-25);

(m) as in claim 9, the read optics 17 comprise wavelength distortion correcting means 24, 27 for correcting the distortion of the reconstructed image caused by the difference in the

wavelength of the reading and writing light (Figs. 4 and 11; signal processor 27 and optical head 24 reconstruct the stored image without error);

(n) as in claim 10, the wavelength of the writing light source 16 is between 400-550 nm, and the wavelength of the reading light source 17 is between 600-700 nm (Fig. 4; page 12, lines 2 and 3);

(o) as in claim 12, the object beam and the reference beam in the read optics and/or the write optics have a common optical axis (Fig. 4: page 9, lines 1-3);

(p) as in claim 12, the polarizing selector means 57 comprise a polarization selective beam splitter and/or the spatial filtering means comprise a beam stop for separating the reflected reference beam from the reflected object beam (Figs. 4, 11 and 16);

(q) as in claim 13, polarization encoder 56 means are provided in the optical path of the reference beam (Fig. 4 and 11; page 9, lines 1-3; page 20, lines 8 and 9);

(r) as in claim 15, the read optics 17 and the write optics 16 have a common objective lens 58 for imaging the reference and object beam onto a recording layer 48 and for imaging the reflected object beams onto the read detectors 44, 45 (Figs. 4, 6, 7 and 11);

(s) as in claim 17, utilizing reflected transmission and polarization hologram with different read and write wavelength, together with distortion correction means 24, 27 for correcting the distortion caused by the difference between the read and write wavelength (Figs. 4 and 11; page 11, lines 23-25; signal processor 27 and optical head 24 reconstruct the stored image without error); and

(t) as in claim 18, the data storage capacity is multiplied by polarization and/or phase code and/or rotational multiplexing (Fig. 4; inherent feature of holographic recording because data can be stored in the same location with different polarization/diffraction angle).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> *(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

7. Claim 14 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Faruqi et al. (WO 97/02563) in view of Henshaw et al. (U.S. Patent 5,319,629).

Faruqi teaches an apparatus for the writing and reading of a holographic recording medium very similar to that of the present invention. However, Faruqi does not teaches the following:

(a) as in claim 14, the polarization encoder is a Liquid Crystal Spatial Light Modulator (LCSLM).

Henshaw teaches a Liquid Crystal Spatial Light Modulator (LCSLM) (column 3, lines 32-34).

Holographic data arrays are recorded with polarized light beams. Hence, to modulate the polarization angle of a light beam with a spatial light modulator, it would have been obvious to one of ordinary skill in the art to replace Faruqi's polarization light modulator 56 with Henshaw's liquid crystal spatial light

modulator, because the Henshaw's LCSLM varies the polarization angle of a light beam based on applied voltages so that light beams with various polarization angles in form of multiplexing beams can be recorded in a single location.

8. Claims 19-23 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Faruqi et al. (WO 97/02563) in view of Steenblik et al. (U.S. Patent 5,715,316).

Faruqi teaches a method for coding of the recorded information on a holographic optical recording medium very similar to that of the present invention. For example, Faruqi teaches the following:

(a) as in claim 19, the recording medium 25 is an optical card where the information is recorded in the form several discrete holograms and/or sub-holograms recoded in different physical and/or logical recording locations on the optical medium (Figs. 4 and 7; page 17, lines 22-28);

(b) as in claim 19, the holograms containing data sets (Figs. 4 and 8; page 18, lines 1-9);

(c) as in claim 19, the sequence of the data sects together constitute the recorded information (Figs. 4 and 8; page 18, lines 1-9);

(d) as in claim 20, the information is recorded in multiplexed holograms, and the logical recording locations are

identified by the multiplexing address (Figs. 4 and 7; page 15, lines 2 and 3; stack of data can be read/identified);

(e) as in claim 21, the information is recorded by polarization holography using phase-code multiplexing (Fig. 4; page 20, lines 23-25);

(f) as in claim 21, one (a stack) hologram contains several phase-coded multiplexed holograms (Fig. 4; page 17, lines 25-28);

(g) as in claim 21, the logical recording locations are identified by the phase code address (Fig. 4; control means 26 for servo addressing identified each phase modulated hologram); and

(h) as in claim 22, the location of the first data set is stored, and the location of the following data sects are stored in the previous data sets (inherent feature of data linking when a data string is stored).

However, Faruqi does not teaches the following:

(a) as in claim 19, the data sets are recorded in a random sequence of the recording locations; and

(b) as in claim 23, the random sequence of the data sects are stored and encrypted and/or made inaccessible for unauthorized users.

Steenblik teaches the following:

(a) the data sets are recorded in a random sequence of the recording locations (Fig. 17A); and

(b) the random sequence of the data sects are stored and encrypted and/or made inaccessible for unauthorized users (Fig. 17A).

Personal information, for example, the financial account of a credit card, should not be recognized by any unrelated personnel. However, this type of private information is usually printed on the surface of an ID card in the form of holographic data. Hence, to hide the recorded information on a holographic card such as Faruqi's, it would have been obvious to one of ordinary skill in the art to record Faruqi's data randomly with an encryption means such as Steenblik's, because the randomized recorded data cannot be reconstructed to its original form so that any unauthorized user without knowing the recorded data's random sequence has no way to decrypt the data.

Allowable Subject Matter

9. Claims 11 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is an Examiner's statement of reasons for the indication of allowable subject matter:

As in claims 11 and 16, the prior art of record fails to teach or fairly suggest the following feature:

(a) the wavelength distortion correcting means of the read optics comprise an aspherical plastic objective lens.

The features indicated above, in combination with the other elements of the claims, are not anticipated by, nor made obvious

11. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action

12. Any response to this action should be mailed to:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Or faxed to:

(571) 273-8300 (for formal communications intended for entry. Or:

(571) 273-7585, (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Any inquiry of a general nature or relating to the status of this application should be directed USPTO Contact Center (703) 308-4357; Electronic Business Center (703) 305-3028.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kim CHU whose telephone number is (571) 272-7585 between 9:30 am to 6:00 pm, Monday to Friday.

Kim-Kwok CHU

kc 12/28/05.

Examiner AU2653
December 28, 2005

(571) 272-7585

William Korzuch

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